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10/519,472	12/29/2004	Keisuke Suzuki	040302-0425	2691

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EXAMINER	
CHUO, TONY SHENG HSIANG	
ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/519,472	SUZUKI, KEISUKE	
	Examiner	Art Unit	
	Tony Chuo	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 October 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Claims 1-16 are currently pending. Claims 10-16 have been added. The previous objection to the specification is withdrawn. The previous objection to claim 7 is withdrawn. The amended claims do not overcome the previously stated 102 and 103 rejections. Therefore, upon further consideration, claims 1-16 are rejected under the following 102 and 103 rejections.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujita et al (US 2002/0192519).

The Fujita reference discloses a fuel cell system and a method of controlling a fuel cell system comprising: fuel cell "200"; a CPU of a power control unit "700" that provides a required electric power (target power) for the fuel cell "200"; a voltage sensor "868" for detecting an actual output voltage of the fuel cell and a current sensor "870" for detecting an actual output current of the fuel cell, wherein these two sensors combine to form a detector for detecting output power from the fuel cell; and a power control unit

"700" comprising: a CPU (target current computing unit) that calculates an electric current (target current) at the required electric power (target power) based on a power-current characteristic map obtained from a nominal output characteristic of the fuel cell, wherein the nominal output characteristic of the fuel cell is a reference output characteristic (See paragraphs [0153],[0159],[0173],[0180] and Figure 12). It also discloses a power control unit that calculates the output power from the product of the detected output voltage and the detected output current (See paragraph [0173]). If the fuel cell is maintained at the target current, then the target current would be equivalent to the detected output current. Therefore, the output power that is calculated by the power control unit is equivalent to the command output power of the fuel cell.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2-8 and 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita et al (US 2002/0192519) in view of Ueda et al (US 2001/0024746), and further in view of Sugiura et al (US 2002/0064697). The Fujita reference is applied to claim 1 for reasons stated above. In addition, the Fujita reference discloses a power control unit "700" that controls the valves "202" & "204" and compressor "504" to control the pressure and flow rate of the respective fuel gas and oxidant gas (See paragraph

[0124]). It also discloses a temperature sensor "872" for detecting the temperature of the fuel cell (See paragraph [0152]). It also discloses output characteristic data for various temperatures of the fuel cell (See Figure 20). It also discloses a CPU that performs the process of setting the fuel cell required electric power (target power) by calculating from the sum of the driving required electric power Ed and an auxiliary machine electric power Es (See paragraph [0175]). In other words, the CPU calculates the target power by taking into account power consumption of auxiliary equipment for power generation of the fuel cell.

However, Fujita et al does not expressly teach a target gas operation point computing unit which calculates a target gas operation point of the fuel gas and the oxidant gas from the target current based on gas operation point characteristics which provides pressure and flow rate of the respective fuel gas and oxidant gas for an output current of the fuel cell, wherein the gas control system controls the pressure and flow rate of the respective fuel gas and oxidant gas based on the target gas operation point calculated by the target gas operation point computing unit. The Ueda reference discloses a control unit "18" (target gas operation point computing unit) that detects the pressure and flow rate of the reformed fuel supplied to the fuel cell and also detects pressure and flow rate of the oxidizing agent supplied to the fuel cell, wherein the target pressure of the fuel gas and oxidant gas is calculated based on a pressure-flow characteristic that provides pressure "P1" and flow rate "Q" of the respective reactant gas for an output current "I" of the fuel cell and then controls the pressure and flow rate

of the fuel gas and oxidant gas based on the target pressure calculated by the control unit (See paragraph [0014], [0070],[0088],[0105],[0107]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Fujita fuel cell system to include a target gas operation point computing unit which calculates a target gas operation point of the fuel gas and the oxidant gas from the target current based on gas operation point characteristics which provides pressure and flow rate of the respective fuel gas and oxidant gas for an output current of the fuel cell, wherein the gas control system controls the pressure and flow rate of the respective fuel gas and oxidant gas based on the target gas operation point calculated by the target gas operation point computing unit in order to provide a control system for a fuel cell that is capable of accurately controlling the pressure-flow characteristics of a reactant gas over a wide output range of the fuel cell (See paragraph [0009]).

However, Fujita et al as modified by Ueda el al does not expressly teach an output characteristic learning unit which learns an actual output characteristic of the fuel cell based on the output power detected by the detector and corrects the reference output characteristic of the fuel cell based on the learned actual output characteristic, wherein target current computing unit creates a revised power-current characteristic based on the reference output characteristic of the fuel cell corrected by the output characteristic learning unit, and wherein the target current computing unit calculates the target current at the target power based on the revised power-current characteristic. The Sugiura reference discloses an electronic control unit “ECU” (output characteristic

learning unit) that learns an actual output characteristic of the fuel cell based on the output voltage detected by voltage sensor and output current detected by the current sensor over an extended period of time and executes an output characteristic correction process that corrects the output characteristic of the fuel cell based on the voltage detected by the voltage sensor and the current detected by the current sensor, thereby creating a revised power-current characteristic based on the reference output characteristic of the fuel cell corrected by the electronic control unit (See paragraphs [0056],[0059] and Figure 7). Examiner's note: The previous output characteristics line shown in Figure 7 is construed as a reference output characteristic of the fuel cell. Since the actual voltage and actual current are known values, then the output power is calculated from the product of the voltage and the current.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Fujita/Ueda target current computing unit to include an output characteristic learning unit which learns an actual output characteristic of the fuel cell based on the output power detected by the detector and corrects the reference output characteristic of the fuel cell based on the learned actual output characteristic, wherein target current computing unit creates a revised power-current characteristic based on the reference output characteristic of the fuel cell corrected by the output characteristic learning unit, and wherein the target current computing unit calculates the target current at the target power based on the revised power-current characteristic in order to more accurately estimate the output characteristic of the fuel

cell and thereby enhance the overall energy efficiency by optimizing the operation of the fuel cell (See paragraph [0008],[0009]).

Response to Arguments

6. Applicant's arguments filed 10/17/08 have been fully considered but they are not persuasive.

According to the applicant's arguments, it is assumed that in the system of Fujita et al., the voltage-current characteristic map is being continuously revised. In that regard, Fujita's voltage-current characteristic map is not a nominal characteristic that corresponds to a reference output characteristic.

The examiner disagrees with the applicant's assumption that the voltage-current characteristic map is being continuously revised. There is no disclosure in Fujita et al that the voltage-current characteristic map is being continuously revised. Figure 12 of Fujita et al is a drawing showing an output characteristic of the fuel cell that shows a relation between an electric power and an electric current. This graph is used as a reference electric power-electric current characteristic map to calculate a target current "Ifc" corresponding to the target power "Ef" (See paragraph [0180]). Therefore, the examiner contends that the electric power-electric current characteristic map disclosed by Fujita et al is based on a nominal power-current characteristic obtained from a nominal output characteristic corresponding to a reference output characteristic.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571)272-0717. The examiner can normally be reached on M-F, 9:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

/Jonathan Crepeau/
Primary Examiner, Art Unit 1795